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ZOOLOGY.

The Cæcal Appendices of the Orthopteran Mid-Gut.[1]—Continuing his observations on the glands connected with the intestine, Bordas points out that in all the Orthoptera, with the exception of the Forficulidæ and Phasmidæ, the well known cæcal appendices of the grasshopper, though varying in form from family to family, may be recognized. The presence or absence of the cæca corresponds more or less closely with different external morphological characters and allows the orthoptera to be divided into two sections. Moreover, the number of these organs, their disposition, their mode of insertion, the folds presented by their internal surface and especially the presence or absence of posterior diverticula, are characteristics by which a number of families may be recognized. For instance, the Mantidæ and the Blattidæ are provided with 8 intestinal cæca, while the Acridiidæ possess but 6, and the Locustidæ as well as the Gryllidæ possess but 2. From his observations upon numerous specimens, he concludes that a series may be distinguished in which paired appendices stand at one end and multiple appendices at the other, or in other words, that the Pseudophylliniæ connect the Acridiidæ with the Locustidæ.—F. C. K.

For many years one of the problematic structures of vertebrate morphology has been the hypochorda or sub-notochordal rod, a slender cord of tissue developed like the notochord from the entoderm and lying ventral and parallel to the larger and better known chorda dorsalis. Its phylogenetic origin, its function and its fate have been uncertain. In the last number of the Morphologisches Jahrbuch, Bd. xxv, are two papers dealing with the subject. In the first, Dr. K. Franz deals with this structure in the Teleostean fishes. His conclusions in brief are that the structure in question is entodermal, that at no time does it contain a lumen, and that it sooner or later entirely degenerates without contributing any elements to the longitudinal ventral ligament of the vertebral column, a view contrary to that of some observers, but in full accord with broader views of morphology. The second paper is by Professor Hermann Klaatsch, and deals with the morphological significance of the subnotochordal rod. He summarizes his conclusions as follows: The hypochorda is a common possession of the higher vertebrates inherited from their ancestors. It is the rudiment of an organ still functional in Amphioxus, the epibranchial groove. . . . . . In the adult Amphioxus this organ is confined to the branchial region, but in the young it extends farther caudally. The great extension of the rudimentary organ above the gut of the higher forms is a secondary appearance.

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[1] L. Bordas: Compt. Rend. Acad. Sci. Paris, CXXIV, (1897), 376--378.

There exists no ground for the view that the hypochorda arises from metameric dorsal entodermal diverticula. The fate of the epibranchial groove is connected with that of the hypobranchial groove, the modifications of the pharyngeal region causing both to become rudimentary. The hypochorda seems in general to degenerate, yet in part it is retained as an elastic band [see Franz, above]; perhaps its elements also play other roles. The reduction of the hypochorda is of significance of an important advance in the Chordate organism in that it renders possible the development of an unpaired [dorsal] aorta.

It is apparent that our most studied forms will repay new and careful study. A few years ago Dr. H. H. Wilder startled the world with his discovery that many of our salamanders were absolutely lungless, and now Professor F. Maurer, one of the most suggestive of German students, has made a strange discovery with regard to certain Amphibia. It is, in short, that in the oral epithelium of at least some terrestrial forms (Rana, Bufo, Hyla, Salamandra, *Triton alpestris*) capillary blood vessels pass through the basal membrane and penetrate the stratified epithelium. After a full description of the conditions found and a few remarks upon the histological and anatomical considerations, he concludes his paper (in the Morphol. Jahrbuch, Bd. xxv) with the suggestion that no doubt these vessels have an important physiological function in that they with the oral epithelium are concerned in respiration. Histological investigations of the oral epithelium of certain of our turtles where Gage (Am. Nat., xx, p. 233, 1886) has described a respiration in the mouth cavity might prove interesting.

Mr. W. G. Ridewood calls attention (Anat. Anzeiger, XIII, p. 499) to the fact that the cartilages recently described by Mr. White and Miss Foote as occurring in Elasmobranchs, are fully described in the older monographs on these forms.

The view advanced by Gervais and Lucus that Scolopendra is ovoviviparous has remained uncontradicted until the present time. Filippo Silvestri (Atti dei Lincei) now states that last year he discovered a specimen of *Scolopendra cingulata* carefully guarding its eggs under a stone, and in June of this year he has found several specimens with their eggs. The ova are pale yellow, ellipsoidal in shape, measuring 2.5 x 3 mm.—*Nature*, August 26, 1897.

Zoological Articles in Recent Journals.—In Vol. 105 of the Sitzungsberichte of the Vienna Academy, Dr. Franz Werner writes upon the Scaling of the Reproduced Tail in Lizards; Dr. F. Steindacher upon some Zoological Results of the Expedition of the " Pola " to the northern part of the Red Sea; Dr. P. Knold upon the Blood Corpuscles of Vertebrates; and Dr. H. Albrecht upon the Comparative Anatomy of the Mammalian Larynx.

PSYCHOLOGY.[1]

Odor-mixture.—The relation of elementary sensations to the sensation of their compound has given rise to much theoretical discussion. In the senses of sight and hearing it has also been the subject of considerable experimental work. The laws of color-mixture have long since been formulated, and the sequence of the color series, like that of the tone series, is well known. In the domain of smell, owing to practical difficulties that attend the investigation, little progress has been made. Certain odors stand marked as qualitatively distinct, but their relations to one another and the arrangement of their "shades" into a single graduated series has never yet been satisfactorily demonstrated. On the other hand, it has been shown that odor-mixtures (of many odors, at least) give rise to new and qualitatively simple odors, thus resembling the color-mixtures rather than the accords of tone combinations. Zwaardemaker, in a recent work, gives a series of nine distinct classes of odors, into one or other of which he thinks any particular odor can be placed. He resolves compound odors into elements belonging to two or more of these classes. When the organ of smell is fatigued for one class of odors, the remaining elements in the compound are sensed, and if the compound consists of but two elements they may readily be distinguished by this means. Both this author and Aronsohn, an earlier writer, speak of certain odors which do not combine to form a mixture, but when placed together give rise to a *blended* sensation, each element of which may be sensed separatively at will. In some compounds, again, one element predominates so strongly that the other is wholly indistinguishable.

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[1] Edited by Howard C. Warren, Princeton University, Princeton, N. J.